Claims

1. An amino acid wherein at least one bond vector in the side chain of said amino acid consists of two NMR-active nuclei bonded together and wherein essentially all other nuclei are NMR inactive.

2. An amino acid wherein at least one bond vector in the side chain of said amino acid consists of two NMR-active nuclei bonded together and wherein essentially all other bond vectors are NMR inactive.

3. The amino acid of claim 1 or claim 2 wherein said two NMR-active nuclei are ^{13}C and ^{1}H, wherein the remainder of the carbon atoms in said amino acid are essentially ^{12}C, wherein the nitrogen atoms in said amino acid are essentially ^{14}N and wherein the remainder of the hydrogen atoms in said amino acid are essentially ^{2}H.

4. The amino acid of claim 1 or claim 2 wherein said two NMR-active nuclei are ^{13}C and ^{1}H, wherein the remainder of the carbon atoms in said amino acid are essentially ^{12}C, wherein the nitrogen atoms in said amino acid are essentially ^{14}N and wherein the remainder of the hydrogen atoms in said amino acid are natural abundance.

5. The amino acid of claim 1 or claim 2 wherein said two NMR-active nuclei are ^{15}N and ^{1}H, wherein the remainder of the nitrogen atoms in said amino acid are essentially ^{14}N, wherein the carbon atoms in said amino acid are essentially ^{12}C and wherein the remainder of the hydrogen atoms in said amino acid are essentially ^{2}H.

6. The amino acid of claim 1 or claim 2 wherein said two NMR-active nuclei are ^{15}N and ^{1}H, wherein the remainder of the nitrogen atoms in said amino acid are essentially ^{14}N, wherein the remainder of the carbon atoms in said amino acid are essentially ^{12}C and wherein the remainder of the hydrogen atoms in said amino acid are natural abundance.

7. A culture medium comprising an amino acid of claim 1 or claim 2.

8. A protein comprising at least one amino acid of claim 1 or claim 2.

9. A method for analyzing the dynamics of a bond vector of a protein comprising producing said protein in a form which comprises an amino acid of claim 1 or claim 2 and subjecting said protein to NMR spectroscopy.

10. A method of determining the entropic contribution of a bond vector of a protein bound to a ligand comprising producing said protein in a form which comprises an amino acid of claim 1 or claim 2 and subjecting said protein to NMR spectroscopy in the presence and the absence of said ligand.

11. A method of preparing an isotopically substituted protein comprising culturing cells that express said protein in a medium containing at least one amino acid according to claim 1 or claim 2 and recovering said protein from the cell culture.